

DIRECT TESTIMONY AND EXHIBITS OF
DAN J. WITTLIFF, BCEE
ON BEHALF OF
THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF
DOCKET NO. 2018-319-E
IN RE: APPLICATION OF DUKE ENERGY CAROLINAS, LLC
FOR ADJUSTMENT IN ELECTRIC RATE SCHEDULES AND TARIFFS
AND REQUEST FOR AN ACCOUNTING ORDER

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
II.	PURPOSE AND SUMMARY OF TESTIMONY	6
III.	EVOLUTION OF COAL ASH MANAGEMENT REGULATIONS	9
IV.	INDUSTRY AND COMPANY COAL ASH MANAGEMENT	24
V.	EXPENDITURES ATTRIBUTABLE ONLY TO CAMA.....	29

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Dan Wittliff. My business address is 919 Congress Avenue, Suite 1110,
Austin, Texas 78701.

Q. PLEASE OUTLINE YOUR FORMAL EDUCATION.

A. I am a 1972 graduate of Southern Methodist University where I earned a Bachelor
of Science degree in mechanical engineering and membership in Pi Tau Sigma mechanical

engineering honorary. In 1975, I earned a Master of Business Administration from the University of Oklahoma where I was elected to membership in the Beta Gamma Sigma business honorary society.

Q. WHAT IS YOUR PRESENT POSITION?

A. I am Managing Director of Environmental Services for GDS Associates, Inc. ("GDS") in Austin, Texas.

Q. WOULD YOU PLEASE DESCRIBE GDS?

A. GDS is an engineering and consulting firm headquartered in Marietta, Georgia with offices in Austin, Texas; Auburn, Alabama; Manchester, New Hampshire; Madison, Wisconsin; and Orlando, Florida. GDS provides technical and financial consulting services to a nationwide base of clients including utilities, Public Service Commissions, large consumers of energy, and various agencies. Areas of expertise include power generation support and management consulting, power supply and transmission planning, rate consulting, distribution services, least cost planning, environmental including permitting and compliance, and litigation support. Power generation support services provided by the firm include plant operational monitoring on behalf of co-owners of fossil and nuclear power plants, plant ownership feasibility studies, plant management audits, plant construction cost and schedule analyses, evaluations of power plant O&M costs and budgeting practices, production cost modeling and plant outage and replacement power cost evaluations, and environmental compliance.

Q. PLEASE STATE YOUR PROFESSIONAL EXPERIENCE.

A. I have been employed by GDS since January 2007. I manage complex and multi-media (e.g., air, water, wastewater, and solid waste) environmental projects including

1 natural gas and coal power plant development, operations, and compliance. Experience
2 previous to joining GDS includes serving as the first Chief Engineer for the Texas Natural
3 Resource Conservation Commission, now known as the Texas Commission on
4 Environmental Quality, which is second only to the Environmental Protection Agency in
5 terms of size. During my four and half years as Chief Engineer, I advised the
6 commissioners of the agency on all aspects of environmental permitting and compliance.
7 This scope spanned the full range of utility plant operations including coal plant operations.
8 In addition, I oversaw the functions of innovative technology, toxicology, and pollution
9 control property tax abatements. Further, as Chief Engineer, I resolved technical
10 disagreements between permittees and the agency and within the agency. Before my
11 service with the Texas Natural Resource Conservation Commission, I served in numerous
12 supervisory positions with West Texas Utilities Company, headquartered in Abilene,
13 Texas, managing the company's multi-media environmental compliance program and
14 overseeing power station performance including issues related to air pollution, water
15 treatment, industrial hygiene, and solid waste disposal. Coal-fired plant operations and
16 compliance were a major part of my responsibilities. Immediately prior to joining GDS
17 Associates, I was Principal of Dan Wittliff Consulting, PLLC. This firm provided
18 professional environmental engineering services that focused on related engineering,
19 regulatory affairs, and energy systems operations, management, and compliance including
20 coal-fired plant operations and compliance. I am a Board Certified Environmental Engineer
21 through the American Academy of Environmental Engineers and Scientists, where I served
22 as a member of the Board of Trustees from 2010 through 2015. I am also a licensed
23 professional engineer. My resume and list of publications are included as Exhibit DJW-1.

Q. HAVE YOU SERVED IN LEADERSHIP ROLES RELATED TO THE ENGINEERING PROFESSION?

A. Yes. I served in various state and national positions with the National Society of Professional Engineers (“NSPE”). I served as president of NSPE from 2012 to 2013 and served on the Board of Directors for eight years. I also served as president of the Texas Society of Professional Engineers from 2002 to 2003. From 2017 to 2018, I served as President of the Engineers’ Week Foundation Board of Directors. Since 2015, I have chaired NSPE’s Committee on Policy and Advocacy which develops policy and position statements on key issues affecting licensed engineers across the country. My committee and I recently rewrote the organization’s professional policies for Energy and Environment along with eight other policies.

Q. HAVE YOU SERVED IN LEADERSHIP ROLES OUTSIDE OF YOUR PROFESSION?

A. Yes. I retired from the Air Force Reserve in 2002 at the rank of Colonel. I served nine years on active duty and 21 years in the reserves. The majority of my active duty was spent in communications maintenance and operations culminating in a stint as commander of a unit on a mountaintop in Central Turkey. When I transferred to the reserves, I joined a combat civil engineering squadron as chief of utilities and structures. From 1996 to 2002, I returned to environmental and civil engineering first as Senior Individual Mobilization Augmentee (“IMA”) to the Environmental Director for the Ogden Air Logistics Center, then as Senior IMA to the Commander of the Civil Engineering Group at Hill Air Force Base (“AFB”), finishing my career as Senior IMA to the Command Civil Engineer of Air Force Materiel Command. At Hill AFB, I advised senior leadership on issues related to

pollution plume remediation and interfaced with the Utah environmental regulators on air permitting and emissions from engines at the base.

Q. PLEASE DISCUSS YOUR COAL COMBUSTION RESIDUALS EXPERIENCE.

A. My coal combustion residuals experience includes the initial startup and testing of fly ash removal, storage, and disposal facilities when I was plant engineering supervisor at Oklaunion Power Station, a 720 MW coal-fired plant near Vernon, Texas from 1985 to 1990. When I served as manager of environmental services for West Texas Utilities Company, from 1991 to 1995, I chaired the Solid Waste Task Force for the Electric Reliability Council of Texas from 1994 to 1995 and participated in the Texas Coal Ash Utilization Group from 1993 to 1995. When I became chief engineer of Texas Natural Resource Conservation Commission in 1995, I led the resolution of coal ash beneficial reuse issues between the state's various electric utilities and the agency's solid waste program management and policy staff. I have also delivered a paper, "Regulatory Advances in Texas," Workshop on Coal Combustion Products, American Coal Ash Association. In the paper, I delineated the results of work between the agency and industry to further define and expand beneficial reuses of coal ash.

Q. HAVE YOU GIVEN TESTIMONY BEFORE?

A. Yes. I filed direct testimony and testified before the North Carolina Utilities Commission in No. E-7 Sub 1146 on January 23, 2018 and in Docket No. E-2 Sub 1142 on December 4, 2017. Recently, I also offered testimony before the Texas State Office of Administrative Hearings, Docket No. 473-14-2252, PUC Docket No. 42087, and before the Florida Public Service Commission, Docket No. 150075-EI.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. BY WHOM HAVE YOU BEEN RETAINED IN THIS PROCEEDING?

A. GDS has been retained by the South Carolina Office of Regulatory Staff (“ORS”).

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to address the certain issues regarding Duke Energy Carolinas, LLC’s (“DEC” or “Company”) and Duke Energy Progress, LLC’s (“DEP”) (collectively the “Companies”) management of their Coal Combustion Residuals (CCR) impoundments including any related legal, regulatory, and cost consequences stemming from that management including:

- 1) The evolution of coal ash management and its regulations;
- 2) The evolution of the Coal Combustion Residuals Final Rule;
- 3) Company History & Current Activities;
- 4) North Carolina’s Coal Ash Management Act (“CAMA”) History;
- 5) A determination whether the Company met environmental compliance and/or best engineering/environmental management practices and if not, whether any resulting cost consequences were either avoidable or unreasonably high; and
- 6) A determination of the extent and timing of ash removal and other compliance costs attributable solely to North Carolina’s CAMA or North Carolina court decisions.

Q. WHAT COAL ASH MANAGEMENT MATERIAL DID YOU REVIEW AND RELY ON TO DEVELOP YOUR TESTIMONY?

A. My review included:

- Information gained from site visits to DEC’s Allen (“Allen”), Belews Creek (“Belews Creek”), Buck (“Buck”), Dan River (“Dan River”), Marshall (“Marshall”), Riverbend

(“Riverbend”), Cliffside (“Cliffside”), and W.S. Lee (“W.S. Lee”) Steam Stations in North and South Carolina and associated CCR facilities;

- DEC responses to data requests addressing the Company’s past and current coal combustion residual practices at each applicable Company facility;
- Inspection reports related to dam safety of CCR impoundments;
- Remediation options analyses;
- Ash Pond Closure plans;
- Testimonies of Company officials and representatives before the South Carolina Public Service Commission (“Commission”) related to these matters;
- Relevant Court Orders, including but not limited to Federal and State Orders related to the Company’s failure to comply with Federal and State laws regarding the management of coal ash prior to the enactment of CAMA;
- Environmental Protection Agency (“EPA”) and other governmental reports;
- Utilities Solid Waste Activities Group documents;
- The rationale for the enactment of the federal CCR Rule and the enactment of CAMA contained in those and associated preambles;
- Insurance documents of the Company from 1996 that indicate the Company understood it had a significant legal exposure regarding discharges of pollutants from ash/coal combustion residual ponds at its coal-fired power plants;
- Information and documents provided by the Company in response to data requests;
- Duke Energy’s SEC 10-K filings for the years 2008-2016; and
- Minutes of Environmental Review Commission of the North Carolina General Assembly meetings for the years 2010 through 2014.

I also relied on my professional training and experience as a licensed engineer with over thirty (30) years of experience at coal-fired power plants including environmental controls, regulations, and compliance from the diverse perspectives of industry, regulatory agency, and consultant.

Q. PLEASE SUMMARIZE YOUR TESTIMONY IN THIS PROCEEDING.

A. In my testimony, I will lay out the evolution of coal ash management regulations to provide context for the development of the Federal CCR Rules and the North Carolina CAMA. I will also describe the role that the February 2014 spill at Dan River Steam Electric Station played in the development of CAMA. Additionally, I will delineate the CCR management solutions employed by coal-fired power plants generally and DEC specifically.

For more discussion on these jurisdictional allocations, please see ORS witness Seaman-Huynh's testimony regarding cost of service, and specifically the discussion related to jurisdictional allocations. While many of the costs requested by DEC in this case resulted from the necessity to comply with the federal CCR Rules or with requirements established by South Carolina authorities and have been recommended for recovery, some or all the expenses sought by DEC for compliance at Buck, Dan River, and Riverbend result solely from CAMA and South Carolina ratepayers haven't traditionally had to pay for costs incurred solely as a result of North Carolina laws.

Please note that, while I reviewed the CCR expenses (both Asset Retirement Obligation ("ARO") and non-ARO) provided by DEC through December 31, 2018 and forecasts beyond that time, my recommendations for allowances and disallowances are based on the actuals for ARO deferrals submitted by DEC in Kerin Exhibit 10 (see Exhibit

DJW-3.1.2) and Non-ARO Expenses in DEC Schedule 1808 (see Exhibit DJW-3.5.8) through September 30, 2018. Any deferral amounts beyond that date should be addressed in a subsequent proceeding.

Regarding the non-ARO expenses claimed in Schedule 1808 (Exhibit DJW-3.5.8), DEC claims \$107,485,857 from January 2015 through September 2018. The data provided by DEC in ORS 29-1 (see DJW-Exhibit 3.7) is in enough granularity to determine what project at what site was included in the numbers in Schedule 1808. While it appears that DEC removed expenses for two projects at Buck as well as Marshall Landfill Cells 3 and 4 from the expenses shown in ORS 29-1 in developing the numbers used in Schedule 1808, I recommend that the claim for \$107,485,857 from January 2015 through September 2018 be allowed in this proceeding. Any non-ARO expenses beyond that date should be addressed in a subsequent proceeding.

Tables 5.2 and 5.4 summarize what is being sought for recovery, my recommended disallowances, and the premise on which these recommendations are based. I recommend that the Commission disallow \$469,894,472 of the \$876,206,294 in ARO deferrals being requested by the Company in this proceeding.

III. EVOLUTION OF COAL ASH MANAGEMENT REGULATIONS

Q. HOW DID COAL ASH MANAGEMENT AND ITS REGULATIONS EVOLVE?

A. Federal Surface Water and Wastewater Regulations – The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution. Growing public awareness and concern for controlling water pollution led to sweeping amendments in 1972. As amended in 1972, the law became commonly known as the Clean Water Act

1 (“Clean Water Act”). Wastewater from steam electric power generating units is regulated
2 under the Clean Water Act National Pollutant Discharge Elimination System (“NPDES”).

3 The 1972 Clean Water Act established the basic structure for regulating pollutant
4 discharges into the waters of the United States and gave the EPA the authority to implement
5 pollution control programs such as setting wastewater standards for the electric utility
6 industry based on the fact that CCRs and coal ash wastewater are pollutants. The Clean
7 Water Act maintained existing requirements to set water quality standards for all
8 contaminants in surface waters and made it unlawful for any person to discharge any
9 pollutant from a point source into navigable waters unless a permit was obtained under its
10 provisions.

11 In accordance with 40 CFR 122.41, the following standard conditions are
12 incorporated into all NPDES permits:

- 13 • **Duty to comply.** The permittee must comply with all conditions of this permit. Any
14 permit noncompliance constitutes a violation of the Clean Water Act and is grounds
15 for enforcement action; for permit termination, revocation and reissuance, or
16 modification; or denial of a permit renewal application. (see 40 CFR 122.41(a))
- 17 • **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent
18 any discharge or sludge use or disposal in violation of this permit which has a
19 reasonable likelihood of adversely affecting human health or the environment. (see 40
20 CFR 122.41(d))
- 21 • **Proper operation and maintenance.** The permittee shall at all times properly operate
22 and maintain all facilities and systems of treatment and control (and related

appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. (see 40 CFR 122.41(e))

- **North Carolina Groundwater (2L) Rules** – In 1979, North Carolina established rules (2L Rules) to protect, maintain, preserve, and enhance the quality of the groundwaters of the State, prevent and abate pollution and contamination of the waters of the state, and to protect public health. These rules require that all entities, including the utility industry, conducting or controlling an activity resulting in the discharge of a waste or hazardous substance to the groundwaters of the State take immediate action to terminate and control the discharge, mitigate any hazards resulting from exposure to the pollutants and notify the Department of Environmental Quality of any such discharge. If as the result of any entity conducting or controlling an activity not permitted by the North Carolina Department of Environmental Quality (“NC DEQ”) which results in an increase in the concentration of a substance in excess of the 2L standards, that entity must implement an approved corrective action plan for restoration of groundwater quality.
- **1979 Los Alamos Report** – In May 30, 1979, the Department of Energy (“DOE”) directed the University of California’s Los Alamos Scientific Laboratory to prepare a paper on the topic of the disposal and reclamation of coal and uranium wastes (Exhibit DJW-4.8). The report indicated that there was a growing awareness that the discarded wastes from coal combustion were a serious potential source of surface and groundwater contamination and that the wastes have the potential for causing great environmental damage if not properly handled. Regarding disposal in ash basins, the authors concluded:

1 The control of contaminated leachates and seepages from disposal ponds for fly ash
2 and scrubber sludge represents, perhaps, the most significant environmental problem
3 facing the southwestern coal and utilities industries. Many trace contaminants that are
4 present in the fly ash or sludge can be mobilized by the waters in the ponds. The transport
5 of contaminants from the disposal ponds into shallow or deep aquifers could result in the
6 degradation of the quality of these waters. Frequently, ash and sludge disposal areas are
7 lined with impermeable materials to reduce the loss of water from them. Nonetheless,
8 careful monitoring of the surface and subsurface effluents from disposal ponds is a
9 necessity in a well-planned disposal and reclamation scheme for coal combustion wastes.

- 10 • **1988 EPA Report to Congress** - The EPA submitted its report to Congress on “Wastes
11 from the Combustion of Coal by Electric Utility Power Plants” in February 1988. This
12 report addressed CCR from electric utility power plants, voicing concerns over the
13 “substantial quantities of wastes” produced by these plants because of the “increasing
14 reliance on coal for producing electricity.” (see Exhibit DJW-4.6 p ES-2) The report
15 forecasted a growth in the production of coal ash and flue gas desulfurization waste from
16 a combined 80 million tons per year in 1984 to 170 million tons in 2000.

17 The report also observed that “[t]he primary concern regarding the disposal of
18 wastes from coal-fired power plants is the potential for waste leachate to cause ground-
19 water contamination” from the potentially toxic metals in the ash. (see Exhibit DJW-4.6 p
20 ES-3) Furthermore, the report observed that “[m]ost utility waste management facilities
21 were not designed to provide a high level of protection against leaching.” (see Exhibit
22 DJW-4.6 p ES-3) In 1988, only about twenty-five percent (25%) of all facilities had liners

of any kind (e.g., clay, synthetic, or composite), although that number had increased to forty percent (40%) of facilities built since 1975. (see Exhibit DJW-4.6 p ES-3)

- **Federal Coal Combustion Residual Rule** – Throughout the evolution of the CCR Rule, beginning with the enactment of the Resource Conservation and Recovery Act (“RCRA”) on October 21, 1976 and ending with the EPA publication of a final rule correcting the effective date of the disposal of coal combustion residuals final rule to October 19, 2015, the primary concern expressed in reports to Congress and others was that coal combustion residuals or products posed a growing environmental risk of groundwater contamination if left unattended.

From the beginning of this evolution, the EPA saw the country’s increasing reliance on coal as a fuel for electrical power generation as presenting significant environmental concerns, as reflected in its February 1988 “Report to Congress on Wastes from the Combustion of Coal by Electric Utility Power Plants.”

On December 22, 2008, a dike used to contain coal ash at the dewatering area of the Tennessee Valley Authority (“TVA”) Kingston Fossil Plant in Roane County, Tennessee failed. Approximately 5.4 million cubic yards of coal ash was released into Swan Pond Embayment and three adjacent sloughs, eventually spilling into the main Emory River channel. The release extended approximately 300 acres outside of the fly ash dewatering and storage areas of the plant.

As a result of this failure, the EPA initiated comprehensive inspections of more than 500 CCR impoundments across the country to determine the condition and risk posed by a dam failure. These inspections took place from 2009 through 2011 and included all of the Company’s surface impoundments. Among the risks posed by dam failures are: loss of

1 life, injury to people and wildlife, loss or significant damage to public and private property,
2 environmental damage to wetlands and waterways, and damage to infrastructure such as
3 roads and bridges.

4 On March 9, 2009, the EPA began mailing information request letters to electric
5 utilities and corporations that had surface impoundments or similar units that contained
6 coal combustion residuals. These letters requested information to assist the EPA in
7 evaluating the structural integrity of these management units.

8 On June 21, 2010, the EPA proposed regulations under RCRA to address the risks
9 from the disposal of CCRs generated from the combustion of coal at electric utilities and
10 independent power producers. This proposal contained two (2) regulatory options due to
11 the significant and technical policy issues involved in regulating these wastes. Under the
12 first, the EPA proposed to list these residuals as special wastes subject to regulation under
13 Subtitle C of RCRA, when they are destined for disposal in landfills or surface
14 impoundments. Under the second option, the EPA proposed to regulate disposal of such
15 materials under Subtitle D of RCRA by issuing national minimum criteria. Under both
16 alternatives, the EPA proposed to establish dam safety requirements to address the
17 structural integrity of surface impoundments to prevent catastrophic releases. After
18 extensive study and examination of all comments received during the rulemaking process,
19 the EPA established regulations under Subtitle D of RCRA (Source EPA web site
20 <https://www.epa.gov/coalash/coal-ash-rule>).

21 On December 19, 2014, the EPA signed the final rule on disposal of coal
22 combustion residuals from electric power plants. The EPA finalized national regulations
23 providing a comprehensive set of requirements for the disposal of coal combustion

1 residuals as solid waste under subtitle D of RCRA. On April 17, 2015, the EPA published
2 the final rule on disposal of coal combustion residuals from electric utilities in the *Federal*
3 *Register*. On July 2, 2015, the EPA published a final rule correcting the effective date of
4 the disposal of coal combustion residuals final rule to October 19, 2015.

5 **Q. WHAT WAS THE SIGNIFICANCE OF THE COMPANY'S IMPOUNDMENT**
6 **FAILURE AT DAN RIVER?**

7 **A.** From February 2, 2014 through February 8, 2014, the unpermitted discharge of
8 approximately 27 million gallons of coal ash wastewater and an estimated 39,000 tons of
9 coal ash into the Dan River occurred through two pipes from Dan River's primary coal ash
10 basin. The coal ash from the release traveled more than 62 miles down the Dan River. Until
11 this event, the draft federal CCR Rule was the driving force in coal combustion residual
12 remediation and closure, and the proposed CCR Rule provided latitude in remediating or
13 closing coal combustion residuals impoundments. The Dan River spill, however, played a
14 deciding role in the development of North Carolina's CAMA in its present form, not only
15 accelerating the timing of action required, but also limiting the options to remediate and
16 close coal combustion residuals impoundments more than would eventually occur under
17 the CCR Rule. In fact, Dr. Wright on page 17, lines 5-7 of his testimony (see Exhibit DJW-
18 3.6), states that there is no doubt that the Dan River spill certainly helped prompt the North
19 Carolina General Assembly to examine the State's and national coal ash disposal policies
20 and regulations.

21 As is demonstrated by the Company's own admissions and the Court's findings in
22 the federal criminal actions, criminal negligence on the part of the Company at Dan River
23 and Riverbend and state environmental rule violations at Dan River and Riverbend, as well

as DEP's Asheville, Cape Fear, and H.F. Lee plants, resulted in damage to the environment.

In addition to language contained within North Carolina's CAMA and legislative drafts of what eventually became CAMA, the court cases and subsequent plea agreements (see Exhibits DJW-5.1 – DJW-5.4) demonstrate that DEC and DEP were criminally and civilly negligent in their operations and maintenance of the impoundments for years prior to the enactment of CAMA, confirming that DEC and DEP failed to responsibly address and correct these issues adequately -- and consequently much less costly -- manner than it is currently being required to do.

Q. HAVE THERE BEEN ANY SUBSEQUENT LEGAL ACTIONS THAT WOULD CAUSE THE EPA TO ALTER THE WAY CLOSURE WAS OR WILL BE HANDLED AT SITES THAT WERE INACTIVE AS OF APRIL 17, 2015? IF SO, PLEASE EXPLAIN.

A. Yes. On August 21, 2018, the DC Circuit Court found that the EPA had allowed utilities to close inactive ponds at coal plants which were shut down on or before April 17, 2015 to be capped in place without regard to whether the ponds were excavated, dewatered, or lined in some way so as to prevent contamination of groundwater by the inactive pond. The Court remanded the portion of the rule on inactive ponds at inactive sites to the EPA for reconsideration. However, until this issue has been addressed by the EPA, the current CCR Rules remain in effect.

Q. DID THE COMPANY'S ACTIONS IMPACT THE ENACTMENT OF CAMA IN ANY WAY? IF SO, PLEASE EXPLAIN.

A. Yes. In the aftermath of the 2008 CCR impoundment failure at TVA's Kingston Fossil plant and after the EPA's dam safety inspections of DEC's and DEP's coal-fired

1 power plants in 2009, the Federal initiatives on CCR Rule development became the driving
2 force in changes to coal ash management. Environmental lawsuits filed in State Courts in
3 2013 and 2014 brought issues associated with seepage, unpermitted discharges,
4 groundwater violations, and drinking water impacts from Dan River, Belews Creek,
5 Cliffside Riverbend, and (in 2015) Buck to the forefront. However, it was the Company's
6 February 2014 impoundment failure at Dan River causing a release of as much as 39,000
7 tons of CCR and 27 million gallons of CCR wastewater into the Dan River that brought a
8 prompt response by the North Carolina General Assembly as reflected in the preamble of
9 an early May 14, 2014 version (see Exhibit DJW-4.4) of the Coal Ash Management Act
10 (Senate Bill 729) which states:

11 Whereas, the issue of coal ash storage has not been adequately addressed in
12 North Carolina for more than six decades; and

13
14 Whereas, on February 2, 2014, an estimated 39,000 tons of coal ash was
15 released into the Dan River following the failure of a stormwater pipe under
16 a utility coal ash impoundment pond in Eden, North Carolina; and

17
18 Whereas, the Department of Environment and Natural Resources
19 ("Department") finds that coal combustion products have settled into the
20 sediment of the river bottom and will require an extensive clean-up plan to
21 complete remediation; and

22
23 Whereas, the Department is in the process of reassessing previous efforts at
24 achieving compliance at coal ash facilities and developing short term and
25 long term policies in light of the Dan River spill, violations discovered in
26 light of increased inspections of coal combustion products disposal facilities
27 and anticipated new federal regulations on coal combustion products; and

28
29 Whereas, it is the intent of the Department to ensure that spills of
30 wastewater are reported to the Department in a defined and adequate time
31 frame; and

32
33 Whereas, it is the intent of the Department to protect surface water and
34 groundwater resources for their best usage; and
35

Whereas, it is the intent of the Department to ensure that all unpermitted wastewater discharges are eliminated or addressed in an environmentally responsible manner; and

Whereas, it is the intent of the Department to equally subject all dams under jurisdiction of G.S. 143-215.23 to the requirements of statute and administrative code; and

Whereas, it is the intent of the Department for the owners of all dams under jurisdiction of G.S. 143-215.23 deemed intermediate and high hazard by the Department to prepare at their own cost documents that describe full and adequate response to emergency situations at their dams and to submit those documents to the Department; and

Whereas, it is the intent of the Department to ensure that emergency situations at dams are reported to the Department in a defined and adequate time frame; and

Whereas, the it is the intent of the Department to increase oversight of dam structure integrity to protect the health and safety of the public; and

Whereas, state law exempts coal combustion products removed from impoundments from being defined as a solid waste; and

Whereas, the Department finds that consistent environmental standards should apply to coal combustion products removed from impoundments for management or disposal and coal combustion products managed or disposed of as a solid waste; and

Whereas, the Department finds the federal Environmental Protection Agency is under consent decree to complete new regulations by December 2014 for coal combustion products that are proposed to bring consistency to requirements for large fills such as structural fills and landfills; and

Whereas, the Department finds that conversion and closure of coal ash storage ponds is necessary for protection of the health and safety of the public;

While the sentiment expressed in this document leaves no doubt in my mind that the spill from Dan River was the seminal event in stimulating the development of CAMA, the other examples of ash mismanagement also played a role in making CAMA as stringent as it became. As is demonstrated by the Company's own admissions and the Court's

findings in federal criminal actions, criminal negligence on the part of the Company at Dan River and Riverbend resulted in damage to the environment. All of these negligent actions on the part of the Company played a significant role in making CAMA more prescriptive and more stringent than enabling state environmental laws had been in North Carolina for a number of years immediately preceding its enactment.

Q. WAS THE NORTH CAROLINA GENERAL ASSEMBLY CONSIDERING LEGISLATION TO REGULATE COAL ASH DISPOSAL PRIOR TO THE DAN RIVER SPILL?

A. As noted in the preamble to CAMA included earlier in my testimony, the General Assembly acknowledged that the “issue of coal ash storage has not been adequately addressed in North Carolina for more than six decades.” In addition, my research of the minutes of the Environmental Commission of the North Carolina General Assembly for the three (3) years prior to the Dan River spill and the month immediately preceding the spill led me to conclude that no legislation was being seriously considered up until the time of the failure. In fact, the only mentions of coal ash in the minutes from February 2010 through January 2014 were as follows:

January 18, 2011

Ms. Sullins said the effect of coal ash on groundwater was being reviewed as part of the renewal of permits for groundwater. Concerning the issue of coal ash, the EPA issued new [draft] rules for coal combustion residuals [in 2010] after the failure of an impoundment in Tennessee. Because of the types of containment of the residuals, the North Carolina Division of Waste Management, Division of Water Quality and the Division of Land Resources are severally involved in this issue. The three Divisions reviewed the EPA rules and submitted comments to the federal agency. The Division considers the EPA rules unsatisfactory, therefore the Division seeks to have EPA treat coal combustion residuals as solid waste and provide states with financial incentives to regulate them as solid waste to recognize state permitting requirements for the substances.

Representative Harrison asked if the Division felt confident that toxins contained in recycled coal ash remained inert. Mr. Matthews said that the technical standards for hazardous and solid waste are similar and should be effective.

December 13, 2012

Representative Samuelson asked about the differences in types of landfills, specifically industrial landfills. Mr. Scott explained that sanitary landfills include municipal solid waste landfills, construction demolition landfills, and industrial landfills. In North Carolina, there are 16 industrial landfills, mostly for the power industry, coal ash, pulp and paper, and one specifically for battery products.

October 9, 2013

Representative Harrison wanted more information on the coal ash ponds and potential groundwater contamination by the power companies? Mr. Gillespie explained that North Carolina has filed a lawsuit against the power companies on this issue and the Southern Environmental Law Center has joined the suit. DENR has followed the guidelines when imposing fines on Progress Energy. The penalty DENR has imposed is five times higher than normal.

Q. HAS SOUTH CAROLINA PASSED LEGISLATION SIMILAR TO CAMA?

A. No. In fact, SC Code Regs 61-79.261 establishes regulations for CCR impoundments as exempt from solid waste designation. A table of my research into state-specific rules on CCR management and impoundments is included as Exhibit DJW-4.7.2 which shows that, in the region around North Carolina, Kentucky, West Virginia, and Georgia adopted the Federal CCR Rules. That said, on January 24, 2019, the State of Virginia reached a bipartisan agreement to move forward on a bill that would require Dominion Energy to excavate all the coal ash at their Virginia coal plants. See Exhibit DJW-9.1.

Q. HAVE YOU PREPARED A COMPARISON OF THE REQUIREMENTS CONTAINED WITHIN THE EPA'S CCR RULE AND CAMA?

1 **A.** Yes. Exhibit DJW-4.7.1 is a side-by-side comparison of the Federal CCR Rule,
2 CAMA, and subsequent amendments. Table 4.1 in Exhibit DJW-4.7.1 summarizes and
3 compares the provisions of CAMA and the CCR Rule. As indicated in the narrative below,
4 CAMA is significantly more restrictive and stringent than the federal CCR Rule.

5 1) CLOSURE MANDATES. From this side-by-side comparison, it is readily apparent
6 that CAMA focuses on basin closure for any impoundment not rated as “low risk”
7 compared to the CCR Rule. CAMA requires closure only for active basins which
8 cannot meet the various safety and environmental criteria, with a high priority on the
9 stability evaluation. While none of the DEC impoundments were originally listed as
10 “low risk,” the Company was able to change the classifications of several of its sites by
11 providing a water supply or water treatment system to neighboring communities) on
12 ground water (see Exhibit DJW-8.5). In Kerin’s Exhibit 10 (Exhibit DJW-3.1.2)
13 indicated that DEC has removed \$22,794,359 in “CAMA-related” from this request for
14 reimbursement. See Table 3.1 below. We concur that these costs should not be
15 reimbursed as should other “CAMA-related” costs that are more stringent than the
16 Federal CCR Rules.

Table 3.1: DEC Changes in Risk Classifications and Drinking Water Supply Spends				
Plant	Basin	Risk Classification May 18, 2016	Risk Classification Nov 14, 2018	CAMA Water Supply Costs (source: discovery response 9-06)
Allen	Active Ash Basin	Intermediate	Low	\$12,966,496
	Retired Ash Basin	Intermediate	Low	
Belews Creek	Active Ash Basin	Intermediate	Low	\$690,069
Buck	Ash Basin 1	Intermediate	Low	\$5,291,799
	Ash Basin 2	Intermediate	Low	
	Ash Basin 3	Intermediate	Low	
Cliffside	Active Ash Basin	Intermediate	Low	\$1,858,801
	Retired Unit 1-4 Basin	Intermediate	Low	
	Retired Unit 5 Basin	Intermediate	Low	
Dan River	Primary Ash Basin	High	no change	\$24,378
	Secondary Ash Basin	High	no change	
Marshall	Ash Basin	Intermediate	Low	\$1,955,527
Riverbend	Primary Ash Basin	High	no change	\$7,289
	Secondary Ash Basin	High	no change	
			TOTAL	\$22,794,359

2) CLOSURE METHODS. CAMA allows only “low risk” coal combustion residuals basins to be closed by cap in place while the CCR Rule allows for cap-in-place closure for a wider range of impoundments.

3) COMPLIANCE TIMING. CAMA directs accelerated timelines for compliance in comparison to the CCR Rule. Many of the expenditures for which DEC is seeking recovery in this proceeding would not be required until a number of years in the future, and others never incurred had CAMA not been passed in reaction to the Dan River spill. At Riverbend, the ash ponds were decanted, dewatered, excavated, and hauled by

1 rail to an off-site mine with a scheduled completion date in mid-2019 under CAMA at
2 considerable cost.

3 4) APPLICABILITY TO INACTIVE SITES. Because the CCR Rule currently applies
4 only to sites that were active as of April 17, 2015. Riverbend was not impacted by the
5 CCR Rule, but was designated for closure under CAMA.

6 5) BENEFICATION REQUIREMENTS. A North Carolina court order and CAMA
7 require ash beneficiation at three (3) sites. One of these sites that have been designated
8 is Buck. The Federal CCR Rules do not require beneficiation.

9 6) CONVERSION TO DRY ASH DISPOSAL. CAMA requires dry fly ash disposal by
10 December 2018 and dry bottom ash disposal by December 2019. The CCR Rule does
11 not expressly address conversion to dry ash disposal. However, in some cases,
12 conversion is driven by basin closure requirements. Furthermore, the EPA extended
13 timelines to accommodate Steam Electric Effluent Limitations Guidelines that propose
14 to require conversion to dry ash disposal. No such extension has been made available
15 in CAMA.

16 7) HIGH PRIORITY SITES. CAMA identified two (2) of the Company's facilities, Dan
17 River and Riverbend, as "**HIGH PRIORITY**" sites, requiring that the time frame for
18 the removal of all ash and the closure of those sites be further accelerated. As is
19 apparent from Kerin's Exhibit 10 (Exhibit DJW-3.1.2), approximately 55 percent
20 (\$484 million out of the total Asset Retirement Obligation ("ARO") 2015-August 2018
21 expenditures of \$876 million) of the monies spent by the Company in 2015-2018 were
22 incurred due to an accelerated closure schedule of these two sites. On May 18, 2016,
23 the NC DEQ released proposed classifications (Exhibit DJW-9.2) for all coal ash ponds

1 in NC, while asking the General Assembly to allow the reconsideration of those
2 classifications in 18 months. Table 3.1 lists the Company's High Priority sites
3 designated by CAMA in 2014 (Dan River and Riverbend) that must be closed by
4 August 1, 2019, and proposes the rest be classified as intermediate priority for which
5 closure would be required by December 31, 2024.

6 On November 14, 2018, the NC DEQ (Exhibit DJW-9.3.) issued another press
7 release which states that Duke Energy met the low-risk classification criteria set forth in
8 CAMA for Allen, Belews Creek, Buck, Cliffside, and Marshall. Low-risk classification
9 requires completion of closure by December 31, 2029.

10 **IV. INDUSTRY AND COMPANY COAL ASH MANAGEMENT**

11 **Q. WHAT SOLUTIONS HAS THE INDUSTRY IMPLEMENTED FOR**
12 **COMPLIANCE AND PROTECTION OF THE ENVIRONMENT FROM THE**
13 **IMPACTS OF COAL ASH DISPOSAL?**

14 **A.** Since the 1970's, industry practices have shown a shift away from surface
15 impoundments and towards landfills and from unlined impoundments towards lined waste
16 management units. In the EPA's 1988 and 1999 reports to Congress, the agency observed
17 the percentage of generating units with lined landfills increased from thirty percent (30%)
18 to fifty-seven percent (57%) between 1975 and 1995. Over the same time frame, lined
19 surface impoundments rose from seventeen percent (17%) to twenty-eight percent (28%).

20 In my experience with coal plants and CCR management, which includes both wet
21 and dry components, liners were placed in new ponds built since the mid-1980's and were
22 placed in Subtitle D compliant landfills built since the mid-1990's. Table 4.1 below
23 illustrates the Company's CCR handling and disposal methods employed at their facilities.

1

Table 4.1: Coal Ash Disposal Basins at Duke Energy Carolinas Coal Fired Power Plants									
Plant	Coal Plant Size (MW)	Basin Name	Combined Basin Surface Area (acres)	Basins Built	Lined (Y/N)	Features	Type of Disposal (Wet/Dry)	Total Ash Impounded (million tons)	NDPES Permit
Allen (NC) Steam Station	1,140								NC0004979
		Active Ash Basin	170	1972	N		Wet	10.46	
		Retired Ash Basin	133	1957	N		Wet	6.15	
		Retired Ash Basin LF	25	2009	Y		Dry	0.89	
		Distribution of Residual Solids 1-4		1995	N				
Belews Creek (NC) Steam Station	2,240								NC0024406
		Active Ash Basin	283	1973	N		Wet	12.24	
		Pine Hill Landfill	52.4	1983	N		Dry		
		FGD Landfill	24	2008	Y		Wet		
		Craig Road Landfill	68	2008	Y		Dry		
		Structural Fill		2003	N		Dry		
Buck (NC) Steam Station (RET)	256								NC0004774
		New Additional Primary Basin	71	1982	N		Wet	3.55	
		Primary Basin	58	1957	N		Wet	2.00	
		Secondary Basin	21	1977	N		Wet	0.86	
Dan River (NC) Steam Station (RET)	278								NC0003468
		Primary Basin	27	1956	N		Wet	1.21	
		Secondary Basin	12	1968	N		Wet	0.39	
		Ash Fill Areas			N		Dry		
Marshall (NC) Steam Station	2,090								NC0004987
		Active Ash Basin	450	1965	N		Wet	16.70	
		Industrial Landfill	35.5		Y	Leachate collection	Wet		
		FGD Residual Landfill	20.6		Y	Leachate collection	Wet		
		Dry CCP Ash Landfill 1		1984	N		Dry		
		Dry CCP Ash Landfill 2		1986	N		Dry		

2

Table 4.1: Coal Ash Disposal Basins at Duke Energy Carolinas Coal Fired Power Plants									
Plant	Coal Plant Size (MW)	Basin Name	Combined Basin Surface Area (acres)	Basins Built	Lined (Y/N)	Features	Type of Disposal (Wet/Dry)	Total Ash Impounded (million tons)	NDPES Permit
Marshall (NC) Steam Station (continued)	2,090								NC0004987
		Asbestos Landfill		1987	N		Dry		
		Demolition Landfill		1984	N		Dry		
		PV Structural Fill	80	2000	N		Dry		
		Road Structural Fill		1997	N		Dry		
Rogers (NC) Energy Complex (formerly Cliffside)	1,387								NC0005088
		Units 1-4 Basin	14	1940	N		Wet	0.42	
		Unit 5 Basin	46	1972	N		Wet	2.35	
		Astice Ash Basin	86	1974	N		Wet	5.06	
		Landfill	182	2016	Y		Dry	2.00	
		Ash Stack 1			N				
		Ash Discovery Area	1.4	2016					
Riverbend (NC) Steam Electric Plant (RET)	454								NC0004961
		Primary Basin	41	1957	N		Wet	2.62	
		Secondary Basin	27	1957	N		Wet	1.00	
		Dry Ash Stack	29	2007					
		Cinder Pit	13	1957					
W.S. Lee (SC) Steam Station (RET)									SCR003705
		Primary Basin	48	1973	N		Wet	2.17	
		Secondary Basin	37	1975	N		Wet	0.03	
		Inactive Ash Basin	19	1951	N		Wet	1.14	
		Ash Fill/Borrow Area	16		N		Dry		
		Dry Stacking Interim Fill Area	13		N		Dry		
TOTAL								71.24	

Q. HAS THE COMPANY KEPT PACE WITH THE REST OF THE INDUSTRY IN ITS COMPLIANCE WITH ITS PERMITS AND WITH ENVIRONMENTAL LAWS GOVERNING COAL ASH MANAGEMENT?

A. No. The Company has been disposing of CCR for at least sixty (60) years. The Company built its first coal-fired power plant (Buck) in October 1926 and built the first of

its currently listed surface impoundments (Dan River Number 1, Primary Ash Basin) in 1956. Except for impoundments and landfills built in response to CAMA and the federal CCR Rule, the most recent of the Company's impoundments was built in 1982. The Company did not vary from its established practice of building, expanding, and continuing to utilize unlined wet surface impoundments despite the increasing concerns reported in industry studies, noted above, with potential ground water impacts from CCR impoundment seeps and leachate. During my December 2018 site visits to the eight (8) DEC plants in North and South Carolina, Company officials contended that the flow coming from the seeps is a small fraction of the flow coming out of the ash basin outfalls permitted under NPDES. While this observation appeared to be true, this does not relieve the Company from complying with the terms of its permits. It is also noteworthy that the engineered (constructed) seeps have been included as permitted outfalls in each plant's NPDES permit while non-constructed seeps have been largely addressed through agreed orders for each plant.

Q. PLEASE SUMMARIZE THE CLOSURE OPTIONS CONSIDERED BY THE COMPANY TO ADDRESS ITS CCR IMPOUNDMENTS AND LANDFILLS.

A. There are essentially four options to closing CCR impoundments: (1) Cap-In-Place, (2) Hybrid Closure, (3) Excavate and Landfill On-Site, and (4) Excavate and Dispose of Off-Site. In addition, there is a process to remove and beneficiate the ash for resale to concrete plants. A description of the closure options follows:

1) OPTION 1: HYBRID CLOSURE – Consists of excavating ash materials from the proposed Closure-by-Removal Areas and the subsequent placement of these ash materials within the proposed consolidated Hybrid Ash Closure Area. Following these

excavation and placement activities, the Hybrid Ash Closure Area will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.

2) OPTION 2: CLOSURE-IN-PLACE – Consists of leaving the ash material within the Ash Basin, which will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.

3) OPTION 3A: CLOSURE-BY-REMOVAL TO EXISTING ON-SITE LANDFILL – Consists of the excavating all ash materials from the proposed Closure-by-Removal Area and placing these ash materials in a new phase of liner within the Existing On-Site Landfill. The existing landfill will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.

4) OPTION 3B: CLOSURE-BY-REMOVAL TO EXISTING & NEW ON-SITE LANDFILLS – Consists of excavating ash materials from the proposed Closure-by-Removal Area, placing those ash materials in a new phase of liner within the Existing On-Site Landfill. Once the new Industrial Landfill is permitted and constructed, excavated ash materials from the proposed Closure-by-Removal Area can subsequently be placed within the new Industrial Landfill. The new phase of the existing landfill and the new Industrial Landfill will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.

5) OPTION 4: CLOSURE-BY-REMOVAL TO OFF-SITE THIRD-PARTY LANDFILL – Consists of excavating the entire Ash Basin and the disposal of the ash material in an existing, off-site, and appropriately lined landfill system.

Q. HOW DID THE CAMA RULES IMPACT ASH BASIN CLOSURE COSTS, STRATEGY, AND SCHEDULE?

A. The CAMA rules enacted accelerated closure schedules for **HIGH PRIORITY** Sites (i.e., Dan River and Riverbend) which had the effect of removing cap-in-place as a viable closure strategy at these sites. This, in turn, forced some sites such as Riverbend, to completely excavate and ship train and truck loads of CCR from the ash ponds to an off-site landfill as much as 125 miles away. Consequently, the CAMA rules resulted in costs exceeding what would have been the costs under the Federal CCR Rules alone.

V. EXPENDITURES ATTRIBUTABLE ONLY TO CAMA

Q. SHOULD SOUTH CAROLINA RATEPAYERS BE REQUIRED TO REIMBURSE DEC FOR EXPENDITURES INCURRED SOLELY DUE TO NORTH CAROLINA'S CAMA OR NORTH CAROLINA COURT DECISIONS?

A. No. It is the position of ORS that costs incurred as a result of jurisdictional laws should not lead to increased costs to ratepayers outside of that jurisdiction. This matter is addressed in the cost of service testimony of ORS witness Seaman-Huynh.

As identified by DEC witness Kerin, DEC has attempted to isolate specific costs associated with CAMA and is not seeking recovery of those costs from South Carolina ratepayers. Additional costs above and beyond those identified by DEC solely attributable to CAMA are further identified below. ORS is not taking the position that South Carolina ratepayers should not pay any costs related to environmental compliance and cleanup at DEC's coal fired generation facilities, only that North Carolina law should not place an additional burden on the ratepayers of South Carolina.

Q. WHAT TYPE OF EXPENDITURES HAVE YOU IDENTIFIED AS BEING SOLELY ATTRIBUTABLE TO CAMA?

A. I have identified the following types of expenditures as being solely attributable to CAMA and not the Federal CCR rules:

- 1) Expenditures for plants not covered at all by the CCR rules. For DEC, Riverbend falls into this category.
- 2) Expenditures for closure and/or excavation options not required under the CCR Rules, but required under CAMA or North Carolina court decisions.
- 3) Expenditures for actions that would not have been required at this time under the CCR rules, but are subject to **accelerated schedules** under CAMA.

Q. ARE ANY DEC PLANTS NOT COVERED BY THE FEDERAL CCR RULES?

A. Yes. Company witness Kerin's Exhibit 10 (Exhibit DJW-3.1.2) states "Riverbend is not currently subject to CCR provisions regarding basin closure." While witness Kerin goes on to state "However, in response to the United States Court of Appeals for the District of Columbia Circuit's August 21, 2018 decision in *USWAG vs. EPA* (No. 15-1219), the EPA is expected to undertake a rulemaking that would regulate inactive impoundments at closed power plants, including the Riverbend basin", this statement is irrelevant to this proceeding.

Q. WOULD THE REGULATION OF INACTIVE IMPOUNDMENTS NECESSARILY LEAD TO THE FORCED CLOSURE AND/OR EXCAVATION OF THE RIVERBEND IMPOUNDMENTS IN A MANNER SIMILAR TO THAT DIRECTED BY CAMA?

A. No. Any speculation as to what regulations the EPA will issue in response to the Court Order is solely that – speculation – and should not be considered in this proceeding.

Q. HOW MUCH HAS DEC REQUESTED IN THIS PROCEEDING FOR THE RECOVERY OF EXPENDITURES AT RIVERBEND?

A. As noted in Kerin Exhibit 10 (Exhibit DJW-3.1.2), the Company is requesting the recovery of \$316,680,585 for specified actions at Riverbend. This entire amount should be disallowed for recovery from South Carolina ratepayers absent any federal regulations directing the actions taken by DEC or similar actions.

Q. WHAT EXPENDITURES FOR CLOSURE AND/OR EXCAVATION OPTIONS NOT REQUIRED UNDER THE CCR RULES, BUT REQUIRED UNDER CAMA, HAS THE COMPANY REQUESTED IN THIS PROCEEDING?

A. The Company's request is summarized in Kerin Exhibit 10 (Exhibit DJW-3.1.2). The following table delineates CCR costs being requested by the Company in their filing:

Table 5.1: DEC Actual and Projected ARO Cash Flows 2015-2018								
	Total Project	Total Costs Incurred					Total	
	Costs (2015+)	1/1/15 - 9/30/18	2015	2016	2017	1/1 - 9/30/18	CF Forecast	10/1 - 12/31/18
DEC								
<u>Operating</u>								
Allen	\$ 266,571,170	\$ 53,734,588	\$ 13,233,460	\$ 19,430,295	\$ 8,306,467	\$ 12,764,367	\$ 212,836,581	\$ 2,634,866
Belews Creek	\$ 348,719,792	\$ 51,150,499	\$ 9,861,194	\$ 26,479,748	\$ 9,534,640	\$ 5,274,917	\$ 297,569,293	\$ 6,833,967
Cliffside	\$ 264,216,906	\$ 71,472,788	\$ 25,869,494	\$ 21,351,036	\$ 13,088,717	\$ 11,163,541	\$ 192,744,118	\$ 744,816
Marshall	\$ 352,048,416	\$ 44,272,414	\$ 13,212,194	\$ 18,159,819	\$ 6,540,243	\$ 6,360,158	\$ 307,776,002	\$ 9,634,230
Total Operating Plants	\$ 1,231,556,284	\$ 220,630,290	\$ 62,176,342	\$ 85,420,898	\$ 37,470,067	\$ 35,562,982	\$ 1,010,925,994	\$ 19,847,880
<u>Retired</u>								
Buck	\$ 577,379,599	\$ 88,125,408	\$ 10,035,189	\$ 9,821,833	\$ 18,828,443	\$ 49,439,943	\$ 489,254,190	\$ 22,977,711
Dan River	\$ 259,894,677	\$ 169,526,789	\$ 38,612,244	\$ 70,263,998	\$ 40,266,416	\$ 20,384,131	\$ 90,367,889	\$ 14,390,516
Riverbend	\$ 433,114,608	\$ 322,350,347	\$ 39,667,308	\$ 86,404,316	\$ 134,089,437	\$ 62,189,285	\$ 110,764,261	\$ 16,381,527
WS Lee (SC)	\$ 278,579,141	\$ 99,145,771	\$ 19,687,325	\$ 35,344,738	\$ 37,577,688	\$ 6,536,020	\$ 179,433,371	\$ 3,389,962
Total Retired Plants	\$ 1,548,968,026	\$ 679,148,315	\$ 108,002,066	\$ 201,834,885	\$ 230,761,985	\$ 138,549,379	\$ 869,819,711	\$ 57,139,716
Total DEC Plants	\$ 2,780,524,310	\$ 899,778,605	\$ 170,178,407	\$ 287,255,783	\$ 268,232,052	\$ 174,112,362	\$ 1,880,745,705	\$ 76,987,595

As shown in Table 5.2 below, four of the plants (Allen, Belews Creek, Cliffside, and Marshall) are pursuing closure options and schedules in compliance with the Federal CCR Rules, and I recommend that all prudently incurred expenditures for these plants be

1 allowed. In addition, W.S. Lee pursued closure options that were coordinated with and
2 approved by the South Carolina Department of Health and Environmental Control
3 (“DHEC”), and I recommend that all prudently incurred expenditures for this plant be
4 allowed.

Table 5.2: Summary of Closure Options and Recommended Disallowances			
Plant	Claimed By DEC per Response 9- 01	Closure Option Compliance with Federal CCR Rules	Recommended Disallowance
Allen	\$ 53,059,021	Federal CCR Compliant	\$ -
Belews Creek	\$ 50,535,423	Federal CCR Compliant	\$ -
Buck	\$ 80,765,334	Beneficiation -- CAMA only	\$ 36,544,788
Cliffside	\$ 66,076,839	Federal CCR Compliant	\$ -
Dan River	\$ 167,426,449	CAMA High Priority - Accelerated Schedule	\$ 116,669,019
Marshall	\$ 43,212,613	Federal CCR Compliant	\$ -
Riverbend	\$ 316,680,665	No Federal CCR Requirements	\$ 316,680,665
WS Lee (SC)	\$ 98,449,950	Federal CCR Compliant & SCDHEC Requirements	\$ -
TOTAL	\$ 876,206,294		\$ 469,894,472

5
6 The three other plants (Buck, Dan River, and Riverbend) shown in Table 5.2 were
7 compelled by the provisions of CAMA to act faster (Dan River and Riverbend) or take
8 actions not required by the Federal CCR Rules (Buck and Riverbend). Dan River and
9 Riverbend were designated as **HIGH PRIORITY** sites by CAMA and compelled by
10 CAMA to complete closure by August 2019. From a Federal CCR Rules perspective, Dan
11 River would not have been required to even begin closure until 2020 while Riverbend was

1 not an affected facility in the final Federal rule. All of Riverbend's CCR was dewatered,
2 excavated, and hauled by rail to the Charah Brickhaven Mine about 125 miles away.

3 **Q. REGARDING BUCK, WHAT EXPENDITURES FOR CLOSURE AND/OR**
4 **EXCAVATION OPTIONS NOT REQUIRED UNDER THE CCR RULES, BUT**
5 **REQUIRED UNDER CAMA, HAS THE COMPANY REQUESTED IN THIS**
6 **PROCEEDING?**

7 **A.** CAMA required beneficiation of CCR at several plant sites in North Carolina. Due
8 to its proximity to the market for beneficiated CCR and the desirable traits of CCR on site,
9 Buck was chosen for this expensive and proprietary process. In addition, as noted above,
10 Buck was originally designated a **HIGH PRIORITY** site under CAMA, and its
11 impoundments have been addressed through beneficiation, a process not shown as a
12 requirement under the Federal CCR Rules. From Kerin Exhibit 10 (Exhibit DJW-3.1.2),
13 the Company has spent \$80,765,334 at Buck from 2015 through August 31, 2018.
14 Company witness Kerin states the work includes "Closure plan development; wetlands
15 delineation; dewatering; planning and overheads; CCR and CAMA wells; alternate
16 spillway; beneficiation facility; groundwater; SW/PW reroute. Buck is subject to CCR rule
17 provisions requiring basin closure." In Kerin Exhibit 10 (Exhibit DJW-3.1.2), Company
18 witness Kerin observes many times that "Engineering and project planning at the current
19 time are needed to synchronize work between all of the coal ash sites being closed in the
20 next 20 years, as well as to gain synergies between excavation/capping plans for all the
21 sites." I concur with this assessment. However, these added costs should only be imposed
22 on South Carolina ratepayers when the actual construction work associated with each site
23 is attributable to the CCR rules only and not due to schedule or scope changes imposed by

1 CAMA. DEC's beneficiation project at Buck clearly falls under the "CAMA-only"
2 category, and the ratepayers of South Carolina should not have to reimburse the Company
3 for expenses related to the CAMA-only beneficiation requirement.

4 **Q. WHAT PORTION OF THESE EXPENDITURES AT BUCK SHOULD BE**
5 **ALLOWED IN THIS PROCEEDING?**

6 **A.** In reviewing the Company's actual and projected costs laid out in Kerin's Exhibit
7 10 (Exhibit DJW-3.1.2), the costs are not described in enough granularity to determine how
8 much of the costs at Buck are associated with appropriate engineering and planning
9 activities, Federal CCR Rules compliance, and compliance with CAMA or other state only
10 requirements. To arrive at a good faith estimate of engineering and planning costs
11 associated with impoundment closures, we assumed that engineering and planning
12 activities at all eight (8) coal-fired power plants were accomplished at the same time
13 between 2015 and 2017. Table 5.3 below includes the data from the DEC's response to
14 ORS Discovery Request 10-09 used to estimate engineering and planning as a percentage
15 of engineering and planning costs.

Table 5.3: Estimating Engineering and Planning Costs for DEC Plants							
Plant	Cost Data From Company Response to SCORS 10-09		2015	2016	2017	2018 thru 9/30	10/1/18 to 12/31/18
Allen	Spend To Date	\$ 53,734,588.32	\$ 13,233,459.69	\$ 19,430,294.80	\$ 8,306,466.84	\$ 12,764,366.99	\$ -
	Remaining Current Year Foreca	\$ 2,634,866.18	\$ -	\$ -	\$ -	\$ -	\$ 2,634,866.18
	Total Pre-Construction (E&P)	\$ 56,369,454.49					
	Total Project Costs	\$ 266,571,170.00					
	Percentage E&P of Total Project	21.15%					
Belews Creek	Spend To Date	\$ 51,150,499.01	\$ 9,861,194.00	\$ 26,479,748.00	\$ 9,534,640.33	\$ 5,274,916.68	\$ -
	Remaining Current Year Foreca	\$ 6,833,966.79	\$ -	\$ -	\$ -	\$ -	\$ 6,833,966.79
	Total Pre-Construction (E&P)	\$ 57,984,465.80					
	Total Project Costs	\$ 348,719,792.00					
	Percentage E&P of Total Project	16.63%					
Cliffside	Spend To Date	\$ 71,472,788.25	\$ 25,869,494.00	\$ 21,351,036.49	\$ 13,088,716.81	\$ 11,163,540.95	\$ -
	Remaining Current Year Foreca	\$ 744,816.44	\$ -	\$ -	\$ -	\$ -	\$ 744,816.44
	Total Pre-Construction (E&P)	\$ 72,217,604.69					
	Total Project Costs	\$ 264,216,906.00					
	Percentage E&P of Total Project	27.33%					
Marshall	Spend To Date	\$ 44,272,414.15	\$ 13,212,194.00	\$ 18,159,819.00	\$ 6,540,243.28	\$ 6,360,157.87	\$ -
	Remaining Current Year Foreca	\$ 9,634,230.32	\$ -	\$ -	\$ -	\$ -	\$ 9,634,230.32
	Total Pre-Construction (E&P)	\$ 53,906,644.47					
	Total Project Costs	\$ 352,048,416.00					
	Percentage E&P of Total Project	15.31%					
TOTAL FOUR	Spend To Date	\$ 220,630,289.73	\$ 62,176,341.69	\$ 85,420,898.29	\$ 37,470,067.26	\$ 35,562,982.49	
	Remaining Current Year Foreca	\$ 19,847,879.72					\$ 19,847,879.72
	Total Pre-Construction (E&P)	\$ 240,478,169.45					
	Total Project Costs	\$ 1,231,556,284.00					
	Percentage E&P of Total Project	19.53%					

During my site visits to Buck in January and December 2018, I noted that substantial progress had been made in developing the property and beginning the construction of the CAMA-required beneficiation plant. The fact that the spend during the period rose from an average of \$12.9 million from 2015 through 2017 compared to \$72.4 million in 2018 led me to conclude that a significant portion of the costs incurred at Buck during 2018 were not engineering and planning costs. Rather, most of these costs appear related to beneficiation site and not compliance with the Federal CCR Rules. For this reason, I recommend disallowing the difference between the total 2018 spend (\$72,417,654) and the average of the previous three (3) years (\$12,895,654) for a total disallowance of \$59,522,499. To adjust this disallowance for the requested reimbursement through September 30, 2018, the \$22,977,711 reported in DEC's response to ORS Discovery Request 10-09 as being spent from October 1, 2018 through the end of the year

1 should be subtracted for a net disallowance of \$36,544,788 for the requested
2 reimbursement.

3 **Q. WHAT EXPENDITURES FOR ACTIONS THAT WOULD NOT HAVE BEEN**
4 **REQUIRED AT THIS TIME UNDER THE CCR RULES, BUT ARE SUBJECT TO**
5 **ACCELERATED SCHEDULES UNDER CAMA, HAVE BEEN REQUESTED FOR**
6 **RECOVERY BY DEC IN THIS PROCEEDING?**

7 **A.** Kerin Exhibit 10 states “Dan River is subject to CCR rule provisions regarding
8 basin closure. 40 CFR §257.101(b) required a written closure plan by October 17, 2016.
9 On October 11, 2018, it was determined that the Secondary Ash Basin at Dan River did
10 not meet the uppermost aquifer location restriction (40 CFR § 257.60). This results in the
11 basin being required to commence closure pursuant to 40 CFR § 257.101(b)(1)(i) no later
12 than October 31, 2020. The last volume of CCR for beneficial use was removed from the
13 Dan River Primary Ash Basin on April 4, 2018, and, within thirty (30) days, the basin
14 commenced closure pursuant to 40 CFR § 257.102(e)(1)(ii). Pursuant to ¶ 5.e. of the Order
15 Granting Motion for Partial Summary Judgment dated June 1, 2016 (No. 13-CVS-4061), a
16 written Site Analysis and Removal Plan was due by December 31, 2016. Sections 3.(b) and
17 3.(c) of CAMA require excavation of the Dan River basins, with the ash disposed of in
18 either an off-site or on-site landfill. (Dan River is a high-priority site, with ash basin closure
19 required by August 1, 2019.)”

20 It is readily apparent from this statement that the CCR rules would not have
21 required closure actions to even *commence* until October 31, 2020, while closure is
22 required to be *completed* by August 1, 2019 under CAMA and the noted North Carolina
23 Partial Summary Judgement.

Q. WHAT AMOUNT HAS DEC CLAIMED FOR CLOSURE AND EXCAVATION EXPENDITURES AT DAN RIVER?

A. DEC has requested recovery of \$167,426,449 in this proceeding.

Q. ARE YOU CONTENDING THAT THIS ENTIRE AMOUNT SHOULD BE DISALLOWED?

A. No. DEC should be allowed to recover in this proceeding any planning and engineering costs that would have been required for compliance with the CCR Rules as they now stand and should be further allowed to seek recovery after 2020 for prudently incurred actual construction and transportation expenditures related to CCR compliance.

Q. WHY IS IT REASONABLE TO ALLOW DEC TO RECOVER ENGINEERING AND PLANNING COSTS?

A. As Company witness Kerin notes several times in Kerin Exhibit 10 (Exhibit DJW-3.1.2), "Engineering and project planning at the current time are needed to synchronize work between all of the coal ash sites being closed in the next 20 years, as well as to gain synergies between excavation/capping plans for all the sites." I concur with this assessment. However, the actual construction work associated with each site should only be allowed if is attributable to the CCR rules only and not due to schedule or scope changes imposed by CAMA.

Q. HOW MUCH OF THE COMPANY'S REQUEST FOR DAN RIVER WOULD YOU ESTIMATE IS PLANING AND ENGINEERING THAT SHOULD BE ALLOWED FOR RECOVERY IN THIS PROCEEDING?

A. Using the same methodology as outlined in the discussion of Buck earlier in my testimony, the weighted average of engineering and planning as a percentage of total

project costs for the four (4) Federal CCR Rules compliant plants (i.e., Allen, Belews Creek, Cliffside, and Marshall) 19.53 percent during the period from 2015 through the end of 2018. Applying this percentage to the \$259,894,677 total project costs, I estimate that engineering and planning activities for the Dan River Steam Electric Station is \$50,757,430 from 2015 through 2018. Based on the information at hand, I concluded that the rest of the \$167,426,449 is caused by the accelerated schedule and other requirements imposed by CAMA on **HIGH PRIORITY** sites. Therefore, I recommend that \$116,669,019 of the Company's request for reimbursement at Dan River be disallowed.

Q. WHAT ADDITIONAL REQUIREMENTS WERE IMPOSED BY CAMA AND WHAT OTHER ACTIONS WERE IMPOSED ON THE COMPANY'S ALLEN, BELEWS CREEK, CLIFFSIDE, MARSHALL, AND W.S. LEE BY THE STATE OF NORTH CAROLINA?

A. The "Cap-In-Place" Options chosen at Allen, Belews Creek, Cliffside, and Marshall are consistent with the Federal CCR Rules, and North Carolina state law does not impose additional requirements at these sites. Therefore, the South Carolina pro rata share of the Company's total spend for these four sites should be allowed to the extent they were prudently incurred.

Because the W.S. Lee site was closed and remediated pursuant to a negotiated agreement with the South Carolina DHEC, the costs associated with this project should be approved for recovery from South Carolina ratepayers to the extent they were prudently incurred.

Q. DO YOU HAVE A SUMMARY OF YOUR RECOMMENDED DISALLOWANCES?

A. Yes. Table 5.3 below summarizes my recommendations for disallowance in the current request for reimbursement. Of the \$876,206,294 currently being requested by the Company for reimbursement, I recommend that the Commission disallow \$469,894.472 for recovery from ratepayers.

Table 5.4: Duke Energy Carolinas Reimbursement Request and Disallowances

Plant	Cost Data				
	Total Project (from SCORS DEC 10-09)	Ask (from Kerin 10)	Disallowance	Rationale	Allow
Allen	\$ 266,571,170	\$53,059,021	\$ 0-	Federal CCR Compliant	\$53,059,021
Belews Creek	\$ 348,719,792	\$50,535,423	\$ 0-	Federal CCR Compliant	\$50,535,423
Buck	\$ 577,379,599	\$80,765,334	\$36,544,788	Beneficiation -- CAMA only	\$44,220,546
Cliffside	\$ 264,216,906	\$66,076,839	\$ 0-	Federal CCR Compliant	\$66,076,839
Dan River	\$ 259,894,677	\$167,426,449	\$116,669,019	CAMA High Priority - Accelerated Schedule	\$50,757,430
Marshall	\$ 52,048,416	\$ 43,212,613	\$ 0-	Federal CCR Compliant	\$43,212,613
Riverbend	\$ 433,114,608	\$316,680,665	\$316,680,665	No Federal CCR Requirements	\$ 0-
W.S. Lee	\$ 278,579,144	\$98,449,950	\$ 0-	Federal CCR Compliant & SCDHEC Requirements	\$98,449,950
TOTAL	\$2,780,524,312	\$876,206,294	\$469,894,472		\$406,311,822

Q. ARE YOU RECOMMENDING THAT DEC BE PRECLUDED FROM RECOVERING COSTS DISALLOWED IN THIS PROCEEDING IN FUTURE PROCEEDINGS?

1 **A.** Not necessarily. If DEC can demonstrate that it has prudently incurred expenses
2 dictated by compliance with the CCR Rules as they stand at the time of its next rate case,
3 any expenses required by the CCR Rule as a stand-alone document (i.e. absent CAMA)
4 and determined to be prudently incurred should be considered for recovery in that forum.
5 However, as noted in my testimony above, many of DEC's claimed expenses are not yet
6 ripe for recovery under the CCR Rules as they stand.

7 **Q. WILL YOU UPDATE YOUR TESTIMONY BASED ON INFORMATION THAT**
8 **BECOMES AVAILABLE?**

9 **A.** Yes. ORS fully reserves the right to revise its recommendations via supplemental
10 testimony should new information not previously provided by the Company, or other
11 sources, become available.

12 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

13 **A.** Yes.

OFFICE OF REGULATORY STAFF
DAN J. WITTLIFF, BCEE
EXHIBIT LIST
DUKE ENERGY CAROLINAS, LLC
DOCKET NO. 2018-319-E

DJW-1	Resume of Dan Wittliff
DJW-2.1.1	January 2018 Site Visit Allen Plant (NC)
DJW-2.1.2	December 2018 Site Visit Allen Plant (NC)
DJW-2.2.1	January 2018 Site Visit Belews Creek Plant (NC)
DJW-2.2.2	December 2018 Site Visit Belews Creek Plant (NC)
DJW-2.3.1	January 2018 Site Visit Buck Plant (NC)
DJW-2.3.2	December 2018 Site Visit Buck Plant (NC)
DJW-2.4.1	January 2018 Site Visit Cliffside Plant (NC)
DJW-2.4.2	December 2018 Site Visit Cliffside Plant (NC)
DJW-2.5.1	December 2018 Site Visit Dan River (NC)
DJW-2.6.1	January 2018 Site Visit Marshall Plant (NC)
DJW-2.6.2	December 2018 Site Visit Marshall Plant (NC)
DJW-2.7.1	January 2018 Site Visit Riverbend Plant (NC)
DJW-2.7.2	December 2018 Site Visit Riverbend Plant (NC)
DJW-2.8.1	December 2018 Site Visit WS Lee Plant (SC)
DJW-3.1.1	November 8, 2018, Jon Kerin Testimony
DJW-3.1.2	November 8, 2018, Jon Kerin Exhibits
DJW-3.2	DEC Response to SCORS Interrogatory 1-22
DJW-3.3	DEC Response to SCORS Interrogatory 9-06
DJW-3.4.0	Summary and Footnotes of ARO Cash Flows
DJW-3.4.1	Allen ARO Cash Flows
DJW-3.4.2	Belew Creek ARO Cash Flows
DJW-3.4.3	Buck ARO Cash Flows
DJW-3.4.4	Cliffside ARO Cash Flows
DJW-3.4.5	Dan River ARO Cash Flows
DJW-3.4.6	Marshall ARO Cash Flows
DJW-3.4.7	Riverbend ARO Cash Flows

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DJW-3.4.8	WS Lee ARO Cash Flows
DJW-3.5.0	Schedule 1800 submitted by DEC
DJW-3.5.1	Schedule 1801 submitted by DEC
DJW-3.5.2	Schedule 1802 submitted by DEC
DJW-3.5.3	Schedule 1803 submitted by DEC
DJW-3.5.4	Schedule 1804 submitted by DEC
DJW-3.5.5	Schedule 1805 submitted by DEC
DJW-3.5.6	Schedule 1806 submitted by DEC
DJW-3.5.7	Schedule 1807 submitted by DEC
DJW-3.5.8	Schedule 1808 Non-ARO Expenses
DJW-3.6	November 8, 2018, Dr. Julius Wright Testimony
DJW-3.7	DEC Response to SCORS Interrogatory 29-1
DJW-4.1	North Carolina Dam Safety Act of 1967
DJW-4.2	National Program for Inspection of Non-Federal Dams
DJW-4.3	USEPA Coal Combustion Residual Rule
DJW-4.4	North Carolina Coal Ash Management Act of 2014
DJW-4.5	Mountain Energy Act 2015
DJW-4.6	Water Infrastructure Improvements for the Nation (WIIN) Act 2016
DJW-4.7.1	Side-by-Side Comparison of Legal Requirements
DJW-4.7.2	Table 4.2 CCR and State Regulations
DJW-4.8	Los Alamos Report
DJW-5.1	Federal Court Case and Plea Agreement
DJW-5.2	May 14, 2015 Joint Factual Statement
DJW-5.2.1	May 14, 2016 Joint Factual Statement
DJW-5.3.1	June 1, 2016 Four Plant Order and Exhibits
DJW-5.3.2	June 9, 2017 Amended Order Granting Motion for Partial Summary Judgement
DJW-5.4	Subsequent Enforcement Actions – Executed Settlement Agreement
DJW-6	DEC Timeline

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DJW-7.1.1	Allen Options Analysis
DJW-7.1.2	Allen Options Analysis Worksheet
DJW-7.2.1	Belews Creek Options Analysis
DJW-7.2.2	Belews Creek Options Worksheet
DJW-7.3.1	Buck Options Reports
DJW-7.3.2	Buck Options Analysis
DJW-7.3.3	Buck Options Worksheet
DJW-7.4.1	Cliffside Options Analysis
DJW-7.4.2	Cliffside Options Worksheet
DJW-7.5	Dan River Conceptual Closure Design Report
DJW-7.6.1	Marshall Options Analysis
DJW-7.6.2	Marshall Options Worksheet
DJW-7.7	Riverbend Closure Design Report
DJW-7.8	W.S. Lee Closure Design Report
DJW-8.1.1	Discovery Analysis – Closure Options
DJW-8.1.2	Discovery Analysis – Recommended Disallowances
DJW-8.2.	Estimating DEC E&P Costs
DJW-8.3	SOC's and Closure Info by Site
DJW-8.4	Original Versus Updated Risk Classifications
DJW-8.5	Analysis of Risk Classifications and Water Spends
DJW-9.1	January 25, 2019 Article by Catherine Morehouse in <i>Utility Dive</i>
DJW-9.2	May 18, 2016 NC DEQ Proposed Classifications for all Coal Ash Ponds in North Carolina
DJW-9.3	November 14, 2018 NC DEQ Low Risk Classifications for Allen, Belews Creek, Buck, Cliffside, and Marshall Coal Ash Ponds